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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/089,433	03/29/2002	Joseph P. Marino, Jr.	P51034	6921

20462 7590 11/14/2003

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EXAMINER	
ANDERSON, REBECCA L	
ART UNIT	**PAPER NUMBER**
1626	

DATE MAILED: 11/14/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/089,433	MARINO, JR. ET AL.	
	Examiner	Art Unit	
	Rebecca L Anderson	1626	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *26 June 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-21* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-15* is/are rejected.

7)☒ Claim(s) *16-21* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *2 IDS'S*.
4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Claims 1-21 are currently pending in the instant application. Claims 1-15 are rejected and claims 1-21 are objected.

Election/Restrictions

Applicant's election with traverse of Group II:

> Claims(s) 1-21 drawn to products of formula (I) wherein X is S, R1 is optionally substituted furan, R2 is optionally substituted Ar-C0-6alkyl, R3 is H, optionally substituted C1-6alkyl, C3-6alkenyl, C3-6alkynyl, methods of preparation and methods of use

in the paper filed 26 June 2003 is acknowledged. The traversal is on the ground(s) that neither the International Searching Authority nor the International Preliminary Examining Authority considered the present claims to lack unity of invention under the PCT rules. This is not found persuasive because according to 37 CFR 1.499,

> If the examiner finds that a national stage application lacks unity of invention under § 1.475, the examiner may in an Office action require the applicant in the response to that action to elect the invention to which the claims shall be restricted. Such requirement may be made before any action on the merits but may be made at any time before the final action at the discretion of the examiner.

For this reason and the reason as found in the Lack of Unity Requirement mailed 23 May 2003, which is that the instant claims lack unity of invention under PCT rule 13.1 and 13.2 since the compounds defined in the claims lack a significant structural element qualifying as the special technical feature that defines a contribution over the prior art. The compounds claimed contain a nitrogen substituted triazole, which does not define a contribution over the prior art (as can be seen by US Patent No. 5,760,246, which discloses example 383 in the table on column 214). The substituents on the nitrogen substituted triazole vary extensively and when taken as a whole result in vastly different compounds. Accordingly, unity of invention is considered to be lacking and restriction of

the invention in accordance with the rules of unity of invention is considered to be proper and is therefore made FINAL.

Claim Objections

Claims 1-21 are objected to for containing non-elected subject matter, specifically subject matter drawn towards other than products of formula (I) wherein X is S, R1 is optionally substituted furan, R2 is optionally substituted Ar-C0-6alkyl, R3 is H, optionally substituted C1-6alkyl, C3-6alkenyl, C3-6alkynyl, their methods of preparation and their methods of use. Claims 1-21 drawn solely to the elected invention and free of the following 35 USC 112 1st paragraph rejections would appear allowable over the prior art of record.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1-15 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Applicants instant claims 1-15 claim a method of inhibiting MetAP2 in mammals with the compound of the formula (IA) (claims 1-5), a method for treating (including prophylactic, page 26 of specification) a disease mediated by MetAP2 in mammals by

administering the compound of formula (IA) (claims 6-10) and a method of treating (ncluding prophylactic, page 26 of specification) conditions mediated by angiogenesis selected from cancer, haemangioma, proliferative retinopathy, rheumatoid arthritis, atherosclerotic neovascularization, psoriasis, ocular neovascularization and obesity by administering the compound of the formula (IA) (claims 11-15).

Applicants instant specification provides references which correlate the treatment of solid tumors with an angiogenesis inhibitor that targets type 2 methionine aminopeptidase (pages 1-4). Applicant states that the inhibition of angiogenesis has been shown to effectively stop the proliferation and metastasis of solid tumors (page 1). Applicant also states that a recently published study has shown that the myristoylation of nitric oxide synthase, a membrane protein involved in cell apoptosis, was blocked by fumagillin. Furthermore, applicant states that there appears to be a clear correlation between the inhibition effect of fumagillin related compounds against the enzymatic activity of hMetAP2 in vitro and the suppression effect of these compounds against tumor-induced angiogenesis in vivo (page 3). Applicant provides many examples of the compounds of the invention on pages 27-97 and provides direction as to how to measure the hMetAP2 activity by direct spectrophotometric assays of hMetAP2 (page 97), by coupled spectrophotometric assays of hMetAP2 (page 98), Kinetic Data analysis (page 99) and how to test the ability of MetAP2 inhibitors to inhibit cell growth by standart XTT microtitre assay (page 99).

However, applicants instant specification also states on page 100 that

> The full structure/activity relationship has not yet been established for the compounds of this invention. However, given the disclosure herein, one of ordinary skill in the art can utilize the

> present assays in order to determine which compounds of the invention are inhibitors of MetAP2 and which bind thereto with an IC50 value in the range of 0.0001 to 100uM.

This statement from page 100 of the instant specification indicates that applicant is not is possession of the methods of inhibiting MetAP2 in mammals, treating diseases mediated by MetAP2 or treating conditions mediated by angiogenesis selected from cancer, haemangioma, proliferative retinopathy, rheumatoid arthritis, atherosclerotic neovascularization, psoriasis, ocular neovascularization and obesity with the compounds of the invention. While applicant has stated in the specification a specific utility for the compounds of the invention for inhibiting MetAP2, treating diseases mediated by MetAP2 and treating conditions mediated by angiogenesis this utility is not sufficiently enabled since applicant has stated that the structure/activity relationship has not yet been established for the compounds of this invention and applicant has only invited one of ordinary skill in the art to experiment and determine which, if any, compounds of the invention are inhibitors of MetAP2. Applicant has not provided data as to which, if any of the compounds of the invention can inhibit MetAP2, treat diseases mediated by MetAP2 or treat conditions mediated by angiogenesis. Applicant is silent to the correlation of the diseases listed as mediated by angiogenesis with angiogenesis or the inhibition of MetAP2. Applicant has only provided examples of the compounds of the invention and assays to test the compounds of the invention. Applicant has only provided an invitation to experiment with the assays provided in the specification in order to determine, with no certainty, which compounds, if any, are inhibitors of MetAP2.

Therefore, since the specification fails to describe the inhibition of MetAP2, treatment of diseases mediated by MetAP2 and the treatment of conditions mediated by

angiogenesis in such a way as to reasonably convey to one skilled in the relevant art that the inventors at the time the application was filed has possession of the claimed invention of claims 1-15, by failing to correlate the disease conditions to MetAP2 and by stating that the full structure/activity relationship has not yet been established for the compounds of this invention, claims 1-15 are rejected under 35 USC 112, first paragraph as failing to comply with the written description requirement.

Claims 1-15 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

As stated in the MPEP 2164.01 (a), "There are many factors to be considered when determining whether there is sufficient evidence to support a determination that a disclosure does not satisfy the enablement requirement and whether any necessary experimentation is "undue."

In *In re Wands*, 8 USPQ2d 1400 (1988), factors to be considered in determining whether a disclosure meets the enablement requirement of 35 U.S.C. 112, first paragraph, have need described. They are:

1. the nature of the invention,
2. the state of the prior art,
3. the predictability or lack thereof in the art,
4. the amount of direction or guidance present,
5. the presence or absence of working examples,
6. the breadth of the claims,
7. the quantity of experimentation needed, and
8. the level of the skill in the art.

In the instant case,

Applicants instant claims 1-15 claim a method of inhibiting MetAP2 in mammals with the compound of the formula (IA) (claims 1-5), a method for treating a disease mediated by MetAP2 in mammals by administering the compound of formula (IA) (claims 6-10) and a method of treating conditions mediated by angiogenesis selected from cancer, haemangioma, proliferative retinopathy, rheumatoid arthritis, atherosclerotic neovascularization, psoriasis, ocular neovascularization and obesity by administering the compound of the formula (IA) (claims 11-15).

The nature of the invention

The nature of the invention is the inhibition of MetAP2 in mammals to treat and prevent diseases mediated by MetAP2 which are diseases mediated by angiogenesis such as cancer.

The state of the prior art

The state of the prior art is that for tumors to grow beyond a critical size and to spread to form metastases, they must recruit endothelial cells from the surrounding stroma to form their own endogenous microcirculation in a process termed angiogenesis and the inhibition of this process has been shown to effectively stop the proliferation and metastasis of solid tumors and that possible roles of MetAP2 in cell proliferation has been suggested.

However, Son et al. Discloses that in regards to 5-Demethylovalicin as a methionine aminopeptidase-2-inhibitor in a model of angiogenesis inhibition, the 5-Demethylovalicin has no cytotoxicity to cancer cell lines.

Also, In regards to page 2 of the instant specification, which discusses that the myristoylation of nitric oxide synthase, a membrane protein involved in cell aptoptosis, was blocked by fumagillin, it is known in the prior art (Lala et al. page 91) that the role of NO in tumor biology remains incompletely understood with both the promotion and inhibition of MO mentioned for the treatment of tumor progression and only certain human cancers may be treated by selected NO-blocking drugs.

Applicants have also stated on page 100 of the instant specification that the full structure/activity relationship has not yet been established for the compounds of the invention.

The predictability or lack thereof in the art

The instant claimed inventions are highly unpredictable as discussed below:

It is noted that the pharmaceutical art is unpredictable, requiring each embodiment to be individually assessed for physiological activity. In re Fisher, 427 F.2d 833, 166 USPQ 18 (CCPA 1970) indicates that the more unpredictable an area is, the more specific enablement is necessary in order to satisfy the statute. In the instant case, the instant claimed inventions are highly unpredictable since one skilled in the art would recognize that in regards to therapeutic effects of the inhibition of MetAP2, whether or not a compound inhibits MetAP2 and whether or not the disease is mediated by angiogenesis or MetAP2 would affect the possible treatment or prevention of any disease.

Hence, in the absence of a showing of the correlation between all the diseases listed as mediated by angiogenesis and a showing of what diseases are mediated by

MetAP2 to the inhibition of MetAP2, and a showing of which, if any, of the instant compounds of the invention inhibit MetAP2, one of skill in the art is unable to fully predict possible results from the administration of the compound as instantly claimed due to the unpredictability of the role MetAp2 in disease treatment and prevention and the unpredictability of the structure/activity relationship for the compounds of the invention and the inhibition of MetAp2.

The nature of the pharmaceutical arts is that it involves screening in vitro and in vivo to determine which compounds exhibit the desired pharmacological activities. There is no absolute predictability even in view of the seemingly high level of skill in the art. The existence of these obstacles establishes that the contemporary knowledge in the art would prevent one of ordinary skill in the art from accepting any inhibition, therapeutic or preventive regimen on its face.

The amount of direction or guidance present and the presence or absence of working examples

Applicants instant specification provides references which correlate the treatment of solid tumors with an angiogenesis inhibitor that targets type 2 methionine aminopeptidase (pages 1-4). Applicant states that the inhibition of angiogenesis has been shown to effectively stop the proliferation and metastasis of solid tumors (page 1). Applicant also states that a recently published study has shown that the myristoylation of nitric oxide synthase, a membrane protein involved in cell apoptosis, was blocked by fumagillin. Furthermore, applicant states that there appears to be a clear correlation between the inhibition effect of fumagillin related compounds against the enzymatic

activity of hMetAP2 in vitro and the suppression effect of these compounds against tumor-induced angiogenesis in vivo (page 3). Applicant provides many examples of the compounds of the invention on pages 27-97 and provides direction as to how to measure the hMetAP2 activity by direct spectrophotometric assays of hMetAP2 (page 97), by coupled spectrophotometric assays of hMetAP2 (page 98), Kinetic Data analysis (page 99) and how to test the ability of MetAP2 inhibitors to inhibit cell growth by standart XTT microtitre assay (page 99).

However, applicants instant specification also states on page 100 that

> The full structure/activity relationship has not yet been established for the compounds of this invention. However, given the disclosure herein, one of ordinary skill in the art can utilize the present assays in order to determine which compounds of the invention are inhibitors of MetAP2 and which bind thereto with an IC50 value in the range of 0.0001 to 100uM.

This statement from page 100 of the instant specification indicates that applicant is not is possession of the methods of inhibiting MetAP2 in mammals, treating diseases mediated by MetAP2 or treating conditions mediated by angiogenesis selected from cancer, haemangioma, proliferative retinopathy, rheumatoid arthritis, atherosclerotic neovascularization, psoriasis, ocular neovascularization and obesity with the compounds of the invention. While applicant has stated in the specification a specific utility for the compounds of the invention for inhibiting MetAP2, treating diseases mediated by MetAP2 and treating conditions mediated by angiogenesis this utility is not sufficiently enabled since applicant has stated that the structure/activity relationship has not yet been established for the compounds of this invention and applicant has only invited one of ordinary skill in the art to experiment and determine which, if any, compounds of the invention are inhibitors of MetAP2. Applicant has not provided data

as to which, if any of the compounds of the invention can inhibit MetAP2, treat diseases mediated by MetAP2 or treat conditions mediated by angiogenesis. Applicant is silent to the correlation of the diseases listed as mediated by angiogenesis with angiogenesis or the inhibition of MetAP2. Applicant has only provided examples of the compounds of the invention and assays to test the compounds of the invention. Applicant has only provided an invitation to experiment with the assays provided in the specification in order to determine, with no certainty, which compounds, if any, are inhibitors of MetAP2.

The breadth of the claims

The breadth of the claims is the inhibition of MetAP2, the treatment and prevention of any disease mediated by MetAP2 and the treatment and prevention of any condition mediated by angiogenesis with the compound of the formula (IA).

The quantity of experimentation needed

The quantity of experimentation needed is undue experimentation. One of skill in the art would need to determine what listed and unlisted diseases would be benefited by the inhibition of MetAP2 and would furthermore have to determine which, if any, of the compounds of the present invention would inhibit MetAP2 since applicant has not provided data as to the structure/activity relationship between the compounds and the inhibition of MetAP2 and has only invited one of ordinary skill in the art to assay to determine which compounds, if any, of this invention are inhibitors of MetAP2.

The level of the skill in the art

The level of skill in the art is high. However, due to the unpredictability in the pharmaceutical art, it is noted that each embodiment of the invention is required to be

individually assessed for physiological activity by in vitro and in vivo screening to determine which compounds exhibit the desired pharmacological activity and which diseases would benefit from this activity.

Thus, the specification fails to provide sufficient support of the broad use of the compounds of the formula (IA) for the inhibition of MetAP2, the treatment and prevention of diseases mediated by MetAP2 and the treatment and prevention of conditions mediated by angiogenesis. As a result necessitating one of skill to perform an exhaustive search for which MetAP2-mediated diseases and which angiogenesis mediated conditions can be treated or prevented by the compound of formula (IA) and which compounds of the present invention can inhibit MetAP2 in order to practice the claimed invention.

Genentech Inc. v. Novo Nordisk A/S (CA FC) 42 USPQ2d 1001 , states that " a patent is not a hunting license. It is not a reward for search, but compensation for its successful conclusion" and "[p]atent protection is granted in return for an enabling disclosure of an invention, not for vague intimations of general ideas that may or may not be workable".

Therefore, in view of the Wands factors and In re Fisher (CCPA 1970) discussed above, to practice the claimed invention herein, a person of skill in the art would have to engage in undue experimentation, with no assurance of success.

Conclusion

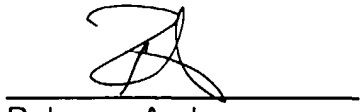
Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Rebecca L. Anderson whose telephone number is (703)

605-1157. Mrs. Anderson can normally be reached Monday through Friday 7:00AM to 3:30PM.

If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, Mr. Joseph McKane, can be reached at (703) 308-4537.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone numbers are (703) 308-1235 and (703) 308-0196.

A facsimile center has been established. The hours of operation are Monday through Friday, 8:45AM to 4:45PM. The telecopier number for accessing the facsimile machine is (703) 872-9306.



Rebecca Anderson
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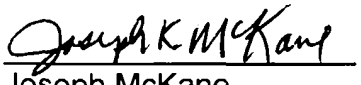

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